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DISPOSABLE DIAPER

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Examiner: Koichi Monzen

References Cited: Japanese Kokai Patent Application Nos. Hei 2[1990]-46844 (JP,A) and Hei 4[1992]-102452 (JP,A); Japanese Kokai Utility Model No. Hei 6[1994]-5615 (JP,U)

[There are no amendments to this patent.]

Claims

1. A disposable diaper characterized by a diaper body having a back waist winding part, two leg winding parts, and a front waist winding part by arranging an absorbing body between a surface sheet and a back face sheet; with leg gathers being respectively formed of elastic materials in the leg winding direction at the above-mentioned two leg winding parts of the diaper body; with waist gathers being respectively formed at both sides of the back waist winding part by an extended part of the elastic material in which the elastic materials of the leg gathers of both sides are respectively extended from both sides of the above-mentioned back waist winding part to the

intermediate part; with waist bands being respectively installed at both ends of the above-mentioned back waist winding part; with the waist band of both these ends having a vertical installation part installed at both ends of the above-mentioned back waist winding part and the connecting part of the elastic materials of both of the above-mentioned sides and the extended parts of the elastic materials, as well as a first horizontal pulling part formed at the upper part of the installation part so that it is continuous to the installation part and pulls the above-mentioned back waist winding part in the waist winding part, a second vertical pulling part formed at the lower part of the above-mentioned installation part so that it is continuous with the installation part and pulls the above-mentioned two leg winding parts in the leg winding direction, a fastening part formed at the outer ends of the above-mentioned first pulling part and the second pulling part so that it is continuous with the first and second pulling parts, and an empty part formed between the above-mentioned first pulling part and the above-mentioned second pulling part and that disperses the tensile stress of the above-mentioned fastening part to the first pulling part and the above-mentioned second pulling part.

2. The disposable diaper of Claim 1, characterized by the fact that the intermediate part of the waist gathers of both sides is superposed on the angular parts of both ends positioned at the back waist winding part of the absorbing body, so that the intermediate part of the waist gathers of both sides is fixed to angular parts of both ends of the above-mentioned absorbing body.

Detailed explanation of the invention

[0001]

Industrial application field

The present invention pertains to a disposable diaper and is worn by assembling in the form of pants by fastening a waist winding part at the time of wearing.

[0002]

Prior art

As a conventional disposable diaper, for example, as described in Japanese Kokai Utility Model No. Hei 6[1994]-5615, a structure in which an absorbing panel is interposed between a surface sheet and a back face sheet, in which elastic parts that expand and shrink in each direction are respectively installed at a back waist winding part and two leg winding parts, in which oblong rectangular fastening segments are respectively installed at both ends of the above-mentioned back waist winding part, in which the installation part of the fastening segments of both sides, both ends of the elastic part of the above-mentioned back waist winding part, and one end of the back side of the elastic part of the above-mentioned two leg winding parts are connected, and in which the above-mentioned absorbing panel is interposed with a certain separation inside of the elastic part of the above-mentioned back waist winding part and the elastic part of the above-mentioned two leg winding parts is known.

[0003]

Problems to be solved by the invention

In the structure described in the above-mentioned publication, since the rectangular fastening segments, which are long in the pulling direction of the back waist winding part, are fixed at both ends of the back waist winding part, when the fastening segments of both sides are pulled when wearing, stress is concentrated in the pulling direction of the fastening segments so that the expansion of the elastic part of two leg winding parts is apt to be insufficient and so that these two leg winding parts cannot be closely contacted to the leg surroundings of the wearer. Also, since the absorbing panel is interposed with a certain separation from the elastic part of the back waist winding part, when the back waist winding part is pulled by the fastening segment, the upper end part of the back waist winding part is folded to the internal surface sheet side, and the sheet, made of a synthetic resin such as polyethylene, of the back face of the back waist winding part makes contact with the wearer. Thus, when the wearer wears it as is, the wearer develops a rash due to the back face sheet or is apt to feel hot and stuffy.

[0004]

The present invention considers such a fact, and its purpose is to provide a disposable diaper in which tensile stress is dispersed to a first pulling part and a second pulling part when waist bands of both ends are respectively pulled when wearing, so that waist gathers can be sufficiently expanded by the first

pulling part and so that leg gathers can be sufficiently expanded by the second pulling part, in which the leakage of excrement can be prevented by making close contact of the back waist winding part and two leg winding parts with the back waist winding surroundings and two leg winding surroundings of the wearer, in which the upper end of the back waist winding part can be prevented from being folded to the surface sheet side of the wearer when pulling the waist bands of both ends, and in which the wearer can be prevented from having a rash due to the back face sheet or from feeling hot and stuffy by preventing contact of the back face sheet with the wearer.

[0005]

Means to solve the problems

The disposable diaper of Claim 1 is characterized by the fact that a diaper body having a back waist winding part, two leg winding parts, and a front waist winding part is formed by arranging an absorbing body between a surface sheet and a back face sheet; that leg gathers are respectively formed of elastic materials in the leg winding direction at the above-mentioned two leg winding parts of the diaper body; that waist gathers are respectively formed at both sides of the back waist winding part by an extended part of the elastic material in which the elastic materials of the leg gathers of both sides are respectively extended from both sides of the above-mentioned back waist winding part to the intermediate part; that waist bands are respectively installed at both ends of the above-mentioned back waist winding part; that the waist band of both of these ends has

a vertical installation part installed at both ends of the above-mentioned back waist winding part and the connecting part of the elastic materials of both of the above-mentioned sides and the extended parts of the elastic materials, as well as a first horizontal pulling part formed at the upper part of the installation part so that it is continuous with the installation part and pulls the above-mentioned back waist winding part in the waist winding part, a second vertical pulling part formed at the lower part of the above-mentioned installation part so that it is continuous with the installation part and pulls the above-mentioned two leg winding parts in the leg winding direction, a fastening part formed at the outer ends of the above-mentioned first pulling part and the second pulling part so that it is continuous with the first and second pulling parts, and an empty part formed between the above-mentioned first pulling part and the above-mentioned second pulling part and disperses the tensile stress of the above-mentioned fastening part to the first pulling part and the above-mentioned second pulling part.

[0006]

The disposable diaper of Claim 2 is characterized by the fact that the intermediate part of the waist gathers of both sides is superposed on the angular parts of both ends positioned at the back waist winding part of the absorbing body, so that the intermediate part of the waist gathers of both sides is fixed to angular parts of both ends of the above-mentioned absorbing body.

[0007]

Function

In the disposable diaper of Claim 1, when wearing it, the back waist winding part makes contact with the back waist surroundings of the wearer, and the front waist winding part makes contact with the front waist surroundings of the wearer. Next, the fastening parts of the waist bands of both ends of the back waist winding part are respectively pulled, the tensile stresses of two fastening parts are respectively dispersed to the first pulling part and the second pulling part by the empty part, so that the waist gathers of both sides are sufficiently expanded by the first pulling part and so that the leg gathers of both sides are sufficiently expanded by the second pulling part. The back waist winding part and two leg winding parts then respectively make close contact with the back waist surroundings and two leg surroundings of the wearer by fastening the fastening parts of the two waist bands by the back face of the front waist winding part.

[0008]

In the disposable diaper of Claim 2, when wearing it, if the fastening parts of the waist bands of both ends of the back waist winding part are respectively pulled, the waist gathers of both sides of the back waist winding part are sufficiently expanded. However, since the intermediate part of the waist gathers of both sides is superposed on the angular parts of both ends positioned at the back waist winding part of the absorbing body and the

intermediate part of the waist gathers of both sides is fixed to the angular parts of both ends of the above-mentioned absorbing body, the upper end of the back waist part is prevented from being folded to the surface sheet side of the wearer via the angular parts of both ends positioned at the back waist winding part of the absorbing body.

[0009]

Application example

Next, the constitution of an application example of the present invention is explained with reference to the figures.

[0010]

In Figures 1 and 2, 1 is a diaper body. In the diaper body 1, a water-permeable surface sheet 2a is included; an absorbing body 4 is arranged between a hydrophobic surface sheet 2b and a back face sheet 3 of both ends of the surface sheet 2a, so that back waist winding part 5, two leg winding parts 6, and front waist winding part 7 are formed. The above-mentioned water-permeable surface sheet 2a is formed from a liquid-permeable material such as synthetic fibers, which allows excrement to permeate. Also, the above-mentioned hydrophobic surface sheet 2b and the above-mentioned back face sheet 3 are formed from a liquid-impermeable material, for example, synthetic resins such as polyethylene, which prevents the leakage of excrement.

[0011]

Also, the above-mentioned surface sheets 2b are respectively formed as bag bases 8, with the outer end of the bag bases 8 of both left and right ends and the outer end of the above-mentioned back face sheet 3 being respectively fixed in a body to the above-mentioned water-permeable surface sheet 2a by adhesion or fusion, and with the upper and lower ends of the inner end being respectively fixed in a body to the above-mentioned back waist winding part 5 and front waist winding part 7 by adhesion or fusion. Elastic materials 10 such as rubber are adhered to free ends 9 between the upper and lower fixed parts. A bag part 11 for preventing the horizontal leakage of excrement is then formed between the left and right bag bases 8 consisting of the above-mentioned hydrophobic surface sheet 2b and the left and right parts of the above-mentioned surface sheet 2a.

[0012]

Furthermore, the above-mentioned absorbing body 4 is formed from an absorbing material for absorbing excrement that permeates from the above-mentioned surface sheet 2a in a state in which it has wide parts 4a and 4b, where the part arranged at the above-mentioned back waist winding part 5 and front waist winding part 7 is widely formed in the left and right directions, and a narrow part 4c, where the part arranged at the above-mentioned two leg winding parts 6, is narrowly formed. The above-mentioned absorbing body 4 is arranged between the above-mentioned surface sheets 2a and 2b and the back face sheet 3 and is fixed in a body to the above-mentioned back face sheet 3 by adhesion or fusion.

[0013]

Also, the above-mentioned back waist winding part 5 and front waist winding part 7 are widely formed in the left and right directions and have a length that can wind the waist of the wearer by the back waist winding part 5 and the front waist winding part 7.

[0014]

Next, leg gathers 13 are respectively formed from several elastic materials 12, which are freely expanded and shrunk in these two leg winding directions, at the above-mentioned two leg winding parts 6. Each end of several elastic materials 12 of the leg gathers 13 of both sides is extended from both sides of the above-mentioned back waist winding part 5 to the upper end of the intermediate part, with waist gathers 15 being respectively formed at both sides of the back waist winding part 5 by the extended parts 14 of the elastic materials. In other words, as shown in Figure 1, the intermediate part of the waist gathers 15 is superposed on the angular parts of both ends positioned at the back waist winding part 5 of the absorbing body 4, and the intermediate part of the waist gathers 15 of both sides is fixed to the angular parts of both ends of the above-mentioned absorbing body 4, so that the waist gathers 15 of both sides are formed by the extended parts 14 of the elastic materials respectively extended toward the upper end of the back waist winding part 5.

[0015]

Also, every other end of several elastic materials 12 of the leg gathers 13 of the above-mentioned both sides is extended from both sides of the above-mentioned front waist winding part 7 toward the upper end of the intermediate part, with waist gathers 17 being respectively formed at both sides of the front waist winding part 7 by the extended parts 16 of the elastic materials. Also, on the back face of the above-mentioned front waist winding part 7, that is, at the position corresponding to the front waist winding part 7 of the above-mentioned back face sheet 3, an adhesive tape 18 having an adhesive surface is fixed in a body on the outer surface. However, the above-mentioned several elastic materials 12 and the extended parts 14 and 16 of the elastic materials are interposed between the above-mentioned absorbing body 4 and the above-mentioned back face sheet 3.

[0016]

Next, waist gathers 19 are respectively installed at both ends of the above-mentioned back waist winding part 5. The waist gathers 19 of both of these ends have a vertical installation part 21 installed at both ends of the above-mentioned back waist winding part 5 and a curved connecting part 20 consisting of several elastic materials 12. There are also extended parts 14 of the elastic materials of the above-mentioned both sides, a first horizontal pulling part 22 formed continuously with the installation part 21 at the upper part of the installation part 21 and that pulls the above-mentioned back waist winding part 5 in the waist winding direction, a second vertical pulling part 23

formed continuously with the lower part of the above-mentioned installation part 21 and that pulls the above-mentioned two leg winding parts 6 in the leg winding direction, and fastening parts 24 formed continuously with the first and second pulling parts 22 and 23 at the outer end of the above-mentioned first pulling part 22 and second pulling part 23.

[0017]

Also, the waist bands 19 of both of the above-mentioned ends are formed between the above-mentioned fastening parts 24 and the above-mentioned first pulling part 22 and second pulling part 23, and have a triangular empty part 25 for dispersing the tensile stresses of the above-mentioned fastening parts 24 to the first pulling part 22 and the second pulling part 23. Also, an adhesive tape 26 having an adhesive surface, which can be freely attached and detached to and from the adhesive surface of the surface part of the above-mentioned adhesive tape 18, is fixed in a body to the fastening parts 24 of the waist bands 19 of both of the above-mentioned ends. The waist bands 19 of both of the above-mentioned ends are then formed in an approximately V-letter shape by the above-mentioned fastening parts 24 and the above-mentioned first pulling part 22 and second pulling part 23.

[0018]

Next, an application of the invention is explained.

[0019]

When wearing the diaper, the back waist winding part 5 makes contact with the back waist area of the wearer, and the front waist winding part 7 makes contact with the front waist area of the wearer. Next, if the fastening parts 24 of the waist bands 19 of both ends of the back waist winding part 5 are respectively pulled toward the waist winding direction, the tensile stresses of these two fastening parts 24 are respectively dispersed to the first pulling part 22 and the second pulling part 23. The waist gathers 15 of both sides of the back waist winding part 5 are respectively and sufficiently expanded by the first pulling part 22, with the leg gathers 13 of two leg winding parts 6 being sufficiently expanded by the second pulling part 23.

[0020]

The back waist winding part 5, front waist winding part 7, and two leg winding parts 6 respectively makes close contact and mounted to the winding surroundings and two leg surroundings of the wearer by adhering and fastening the adhesive surface of the adhesive tape 26 of the fastening parts 24 of two waist bands 19 to the adhesive surface of the adhesive tape 18 of the front waist winding part 7.

[0021]

Thus, excrements of the wearer are absorbed and held by the absorbing body 4 consisting of the water-permeable surface sheet 2a formed of a liquid-permeable material, however since the back

face sheet 3, which coats the back face of the absorbing body 4, is formed of a liquid-impermeable material, the excrements are prevented from being leaked from the back face sheet 3.

[0022]

Also, the surface sheet 2a forms the bag part 11 having the hydrophobic surface sheet 2b in which the opposite inner ends are opened as the free ends 9 at both ends in the left and right directions, with the waist surroundings and two leg surroundings of the wearer being closed in an airtight state by the waist gathers 15, 17 of both sides and the leg gathers 13 of both sides, so that the leakage of excrement from the waist surroundings and two leg surroundings of the wearer is prevented.

[0023]

Also, at the time of the above-mentioned wearing, with regard to the fastening parts 24 of the waist bands 19 of both sides of the back waist winding part 5, the waist gathers 15 of both sides of the back waist winding part 5 are sufficiently expanded, but the angular parts of both ends positioned at the back waist winding part 5 of the absorbing body 4 are fixed in one body to the waist gathers 15 of both of these sides and superposed. In other words, as shown in Figure 1, in the waist gathers 15 of both sides, the intermediate part of the waist gathers 15 is superposed on the angular parts of both ends positioned at the back waist winding part 5 of the absorbing body 4, and the intermediate part of the waist gathers 15 of both of these sides is fixed to the angular parts of both ends of the

above-mentioned absorbing body 4. Thus, even if the waist gathers 15 of both sides of the back waist winding part 5 are sufficiently expanded, the upper part of the back waist winding part 5 is prevented from being folded toward the surface sheets 2a and 2b of the wearer by the angular parts of both ends positioned at the back waist winding part 5 of the absorbing body 4.

[0024]

Therefore, the back face sheet 3, composed of a synthetic resin such as polyethylene, of the surface of the back waist winding part 5 is not in contact with the waist surroundings of the wearer, or the wearer is not worn as is. Thereby, the surface sheets 2a and 2b are prevented from being the cause of a rash of the waist of the wearer or the cause of a hot and stuffy state.

[0025]

Next, in the above-mentioned application example, each end of the extended parts 14 of several elastic materials, in which the waist gathers 15 are formed at both sides of the back waist winding part 5, is extended to the upper end of the back waist winding part 5 along the extended line toward the vertical direction of the opposite free ends 9 of the bag part 11, and a prescribed wide inelastic part having no extended parts 14 of the elastic materials is formed between one end of the extended parts of several elastic materials of both of these sides. However, without being limited to this example, as shown in Figure 3, one end of the extended parts 14 of several elastic materials, in

which the waist gathers 15 of both sides are formed, may also respectively approach the inside from the extended line toward the vertical direction of the opposite free ends 9 of the bag part 11 and extend to the upper end of the back waist winding part 5. A narrow inelastic part having the extended parts 14 of the elastic materials may also be formed between one end of the extended parts 14 of several elastic materials of both of these sides.

[0026]

With such a constitution, when wearing the diaper, the waist gathers 15 of both sides are expanded, so that the back waist winding part 5 makes further contact with and is mounted to the waist of the wearer. The leakage of excrement from the waist of the wearer can then be reliably prevented.

[0027]

Next, in each of the above-mentioned application examples, the waist gathers 15 of the back waist winding part 5, waist gathers 17 of the front waist winding part 7, and leg gathers 13 of two leg winding parts 6 are formed of a series of several elastic materials 12, so that the waist gathers 15 of the back waist winding part 5, waist gathers 17 of the front waist winding part 7, and leg gathers 13 of two leg winding parts 6 are simply formed by one process. Also, the waist gathers 15 continuous to the leg gathers 13 are formed at both sides of the back waist winding part 5, so that a process for separately forming the waist gathers 15 at the back waist winding part 5 is omitted.

[0028]

Effect of the invention

According to the invention of Claim 1, when the fastening parts of the waist bands of both ends of the back waist winding part are respectively pulled at a time of wearing the diaper, the tensile stresses of the fastening parts are dispersed to the first pulling part and the second pulling part, so that the waist gathers of both sides of the back waist winding part can be sufficiently expanded by the first pulling part and so that the leg gathers of two leg winding parts can be sufficiently expanded by the second pulling part. Therefore, the back waist winding part and two leg winding parts can be simply mounted in a state in which they make close contact with the back waist surroundings and two leg surroundings of the wearer, so that the leaking of excrement from the back waist surroundings and two leg surroundings of the wearer can be prevented.

[0029]

According to the invention of Claim 2, when the fastening parts of the waist bands of both ends of the back waist winding part are pulled, the upper part of the back waist winding part can be prevented from being folded to the surface sheet side of the wearer by the angular parts of both ends of the absorbing body. Thus, the back face sheet is prevented from making contact with the wearer, so that the wearer can be reliably prevented from having a rash or feeling hot and stuffy due to the back face sheet.

Brief description of the figures

Figure 1 is a development showing the disposable diaper of an application example of the present invention.

Figure 2 is an oblique view showing its mounting state.

Figure 3 is a development scheme of the disposable diaper of another application example.

Explanation of symbols

1	Diaper body
2a, 2b	Surface sheets
3	Back face sheet
4	Absorbing body
5	Back waist winding part
6	Two leg winding parts
7	Front waist winding part
12	Elastic material
13	Leg gathers
14	Extended part of an elastic material
15	Waist gathers
19	Waist band
20	Connecting part
21	Installation part
22	First pulling part
23	Second pulling part
24	Fastening part
25	Empty part

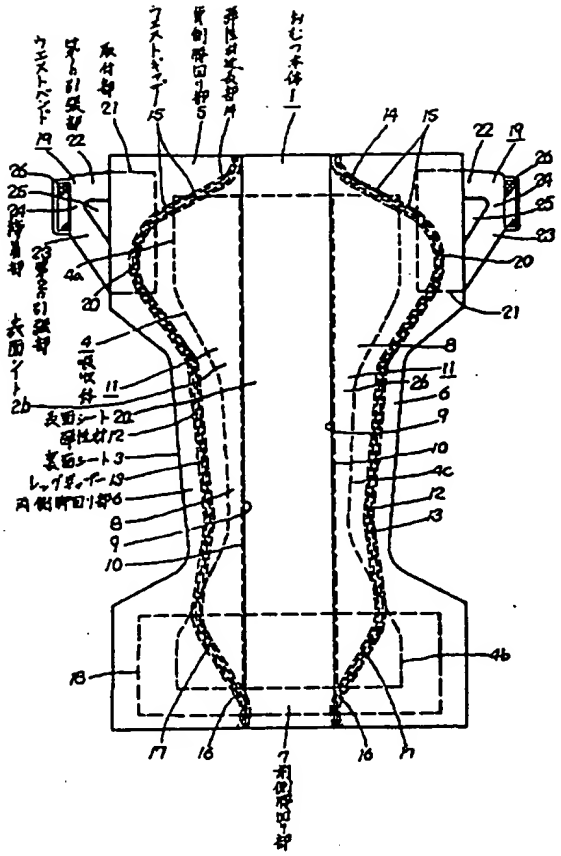


Figure 1

Key: 1 Diaper body
2a Surface sheet
2b Surface sheet
3 Back face sheet
4 Absorbing body
5 Back waist winding part
6 Two leg winding parts
7 Front waist winding part
12 Elastic material

13 Leg gathers
14 Extended part of an elastic material
15 Waist gathers
19 Waist band
20 Connecting part
21 Installation part
22 First pulling part
23 Second pulling part
24 Fastening part

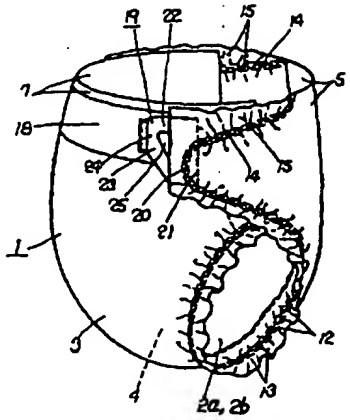
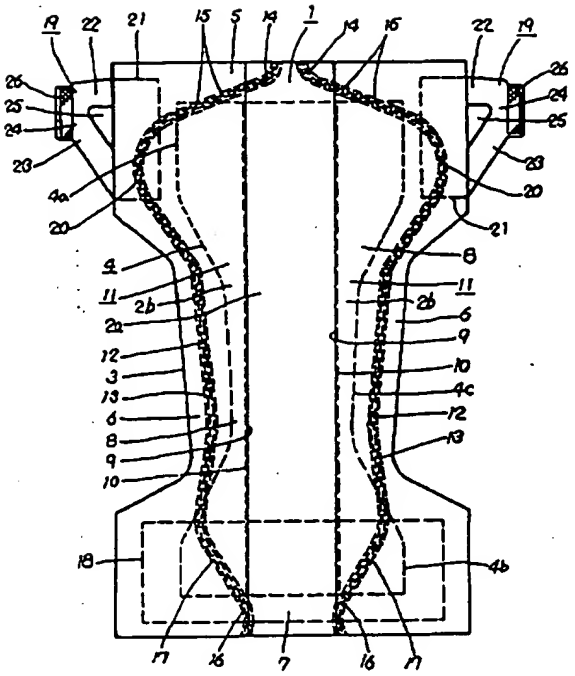


Figure 2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16
17
4b
4c

Figure 3